GCP Technologies helps fast-track prestigious Dubai Development

ICD Brookfield Place is located in the Dubai International Finance Centre (DIFC). The 54-storey mixed-use scheme, designed by Foster & Partners, spans four acres.

Project	ICD Brookfield Place
Architect	Foster & Partners
Contractors	Multiplex
Structural Specialists	Robert Bird Engineering Group
GCP Solutions	PREPRUFE® 300R Plus waterproofing membrane

The Project

25,000m^2 approx.

of PREPRUFE®300R Plus used on site.

ICD Brookfield Place is located in the Dubai International Finance Centre (DIFC). The 54-storey mixed-use scheme, designed by Foster & Partners, spans four acres. It is an ambitious development that challenges the world's interpretation of 'workplace', featuring fine dining, retail and community spaces, alongside 900,000 sq ft of modern offices. But it was its seven basements - being excavated to hold 2,700 car parking spaces - that presented contractors, Multiplex, alongside structural specialists, Robert Bird Engineering Group, with a complex scenario that could have held up the entire project.

CORE CHALLENGES

Reaching a depth of 42 metres, the excavation phase involved a multitude of issues. Not only is it believed to be the deepest basement in the United Arab Emirates (UAE) - causing clear access problems - but the project was under immense pressure. Both in terms of the high water table and uplift of the groundwater, as well as scrutiny from important stakeholders should delays be incurred on such a prestigious scheme.

The application of waterproofing could be fast-tracked, but it would require a heightened level of technical expertise and an aptitude for problem-solving. GCP Applied Technologies' experience and right waterproofing solution of similar high-end, difficult and deep work on key infrastructure projects across the globe, secured the basement waterproofing work in 2017.

ADDITIONAL COMPLEXITIES

The biggest issue from a waterproofing perspective was that the base had not yet been fully excavated before works were due to commence. This meant that the waterproofing membrane had to be applied in a module fashion, 200-300 sq m sections at a time, starting from the centre of the site footprint then moving outwards as the concrete pours were completed. While groundworks continued alongside the waterproofing application, the three parties responsible also had to deal with a series of complications on every side of the project, namely:

- There were diaphragm walls on two sides, with an existing building, four basements deep, on another - one of which had already been waterproofed. This required development of a specific solution in order to ensure GCP's technology interfaced with the existing waterproofing, to prevent damage or leaks.
- There was also a pre-existing tunnel, three basements deep, that needed two access routes into two of the basements. The required entrances needed constructing and waterproofing.
- The water pressure on the basements was another core concern, both for the design and waterproofing. The water table was only four-to-five metres below ground level prior to excavation, and so the pressure was extremely high. A waterproofed, four metre thick concrete raft slab counteracts this uplift issue.

In addition to these geotechnical complexities, there was a critical lack of storage space above-the-ground. Situated in a bustling metropolitan area with a busy road and plaza surrounding the build, ICD Brookfield Place was, logistically, exceptionally difficult for the on-site contractors.

Materials had to be craned 42m down: a problem that GCP's waterproofing solution also helped to solve. Once the centre of the site was waterproofed and concrete casted, it allowed for the erection of a huge tower crane, transporting materials from the storage area down into the deep basement.

SOLUTIONS

GCP Applied Technologies and its PREPRUFE®300R Plus waterproofing membrane was chosen due to the obvious complexities of the project, the known track record of the Preprufe advanced technology and the need for round-the-clock GCP experienced and highly qualified technical support throughout the build.

PREPRUFE®300R Plus is a pre-applied waterproofing membrane that can be used horizontally or vertically, below raft slabs and confined vertical retaining wall for blind side applications. Comprising a HDPE film, pressure sensitive adhesive, weather resistant protective coating and dual adhesive ZIPLAP™ seams, the membrane was technically proven to be fit for conditions such as those at the ICD Brookfield Place site. Around 25,000m² of PREPRUFE®300R Plus waterproofing membrane was used on the ICD Brookfield Site.

The PREPRUFE®300R Plus system is ideal for rapid installation and the ADVANCED BOND TECHNOLOGY™ with its dual adhesive ZIPLAP™ seams form an integral bond with poured concrete, providing a robust barrier to water, moisture and gas.

Furthermore, PREPRUFE®300R Plus membrane does not require any specialist equipment, electricity or heat, which was vitally important in the case of ICD Brookfield Place, due to the tight deadlines and even tighter workspace.

As well as the proven track record of GCP's PREPRUFE®Plus waterproofing membrane, the GCP Technical services team was awarded the project due to the clear added value they would bring to the project. Testament to this, GCP submitted 300+ site visit reports during the two years they were involved in the works, often responding to emergency calls and advising on unforeseen issues due to the ongoing excavation.

The agility of those involved in the waterproofing application - working non-conventionally to achieve critical project deliverables - meant the groundworks were completed two to three months ahead of time and facilitated the success of the wider scheme.

"While ICD Brookfield was a demanding project, we are used to complex projects, this is what we do, and we found the opportunity to demonstrate it in the highly extreme conditions of the Middle East. Overcoming the various complexities that cropped up along the way, and building a close working relationship with general contractor Multiplex and the Specialist waterproofing Applicators Protect Middle East gave us all a great sense of achievement."

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Peter Dey, Technical Service Manager for Middle East, Africa and India

About GCP Applied Technologies

GCP Applied Technologies is a leading global provider of construction products technologies that include additives for cement and concrete, the VERIFI®in-transit concrete management system, high-performance waterproofing products, and specialty systems. GCP products have been used to build some of the world's most renowned structures.

More information is available at www.gcpat.uk

Product Information: PREPRUFE® Plus membrane Data Sheet

This document is only current as of the last updated date stated below and is valid only for use in the United Kingdom. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.uk. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

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